

## **Intended Learning Outcomes**

### **Biological Sciences BA Degree, University of Alaska Fairbanks**

#### **1. Knowledge**

Graduates should demonstrate broad knowledge of core biological concepts, including evolution, inheritance and the expression of genes, cellular and organismal structure and function, and biologically-relevant pathways and transformations of energy and matter. Graduates should demonstrate depth of knowledge in at least one sub-discipline of biology.

#### **2. Competency**

**Communication:** Biology graduates should communicate clearly and accurately about biological issues in both oral and written form. In particular, they should be able to argue cogently from evidence, write the findings of a simple biological study in the format of a scientific paper, and give an effective oral presentation on a biological issue.

**Technical proficiency:** Graduates should be able to apply the basic tools of the biologist. They should be competent in basic laboratory skills and techniques. They should be able to record and maintain accurate data records and to summarize, graph, and interpret data sets using computer tools. They should be able to use computer software to produce a technical report that includes graphs, tables, and references .

**Information literacy:** Biology graduates should recognize when information is needed and have the ability to locate, evaluate critically, and use effectively the needed information. They should be aware of, and be able to access, publically available biological databases. They should be able to access the technical literature in biology using online resources, and to distinguish between peer-reviewed scientific literature and less dependable sources of information. They should be able to correctly interpret the goal, approach, and basic findings of a biological journal article. Graduates should cite others' work responsibly and accurately.

**Quantitative approaches:** Graduates should be able to apply quantitative approaches to problem solving in biology. In particular, they should be competent to recognize bias in data collection and appreciate the role of stochasticity in biological processes. They should be able to distinguish discrete and continuous variation, summarize and analyze data using statistics, and create visual displays of information that effectively summarize data.

**Collaboration:** Graduates should be able to collaborate effectively with others on scientific projects, leading to a productive outcome.

#### **3. Critical and creative thinking**

Graduates should be able to apply their knowledge of the principles of biology, chemistry, physics, and mathematics to solve problems in biology. They should be able to critically evaluate biological claims, such as those they will encounter in the scientific literature and the media. They should be able to address the impact of modern biology on society. Graduates should be able to formulate hypotheses and predictions, design a study, interpret the results logically, and communicate the results effectively.